<u>Claims</u>

1. (Currently Amended) In a method for making a rigid polyurethane foam by reacting a polyisocyanate and a polyol in the presence of a urethane catalyst, a blowing agent, optionally water, and a silicone surfactant, the improvement which comprises employing a blowing agent comprising a C4 or C5 hydrocarbon, or mixtures thereof, with an average molecular weight of ≤ 72 g/mole and a boiling point in the range of 27.8 to 50 °C, and 0.5 to 3.5 parts by weight per 100 parts polyol (pphp) of a silicone surfactant comprising a polyether-polysiloxane copolymer represented by the following formula:

$$(CH_3)_3$$
-Si-O- $(Si(CH_3)_2$ -O)_X- $(Si(CH_3)(R)O)_V$ -Si(CH₃)₃

where

$$R = (CH_2)_3 - O - (-CH_2 - CH_2 - O)_a - (CH_2 - CH(CH_3) - O)_b - R''$$
, and

where R" is H, $(CH_2)_zCH_3$, or $C(O)CH_3$; x + y + 2 is $60 \underline{67}$ -130; x/y is 5 - 14; z is 0-4; the total surfactant molecular weight, based on the formula, is 7000 - 30,000 g/mole, the wt% siloxane in the surfactant is 32 - 70 wt%, the blend average molecular weight (BAMW) of the polyether portion is 450 - 1000 g/mole, and the mole% of ethylene oxide in the polyether portion is 70 - 100 mole%.

- 2. (Currently Amended) The method of Claim 1 in which x + y + 2 is $\frac{60}{67}$ -130; x/y is 5-10; a + b is 10-18; and the mole% of ethylene oxide in the polyether portion is 70-100 mole%.
- 3. (Original) The method of Claim 1 in which x + y + 2 is 90-130; x/y is 10-14; a + b is 10-16; and the mole% of ethylene oxide in the polyether portion is 70-80 mole%.
- 4. (Currently Amended) The method of Claim 1 in which x + y + 2 is $\frac{60}{67}$ -80; x/y is 5-8; a + b is 10-16; and the mole% of ethylene oxide in the polyether portion is 70-100 mole%.
- 5. (Original) The method of Claim 1 in which x + y + 2 is 110-130; x/y is 5-8; a + b is 12-16; and the mole% of ethylene oxide in the polyether portion is 70-80 mole%.

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- 6. (Original) The method of Claim 1 in which the blowing agent comprises cyclopentane, isopentane, isobutane or mixtures thereof.
- 7. (Original) The method of Claim 1 in which the blowing agent comprises a mixture ranging from <100 to 50 wt% cyclopentane and >0 to 50 wt% isopentane, based on C5 components, and optionally also containing butane isomers.
- 8. (Original) The method of Claim 1 in which the blowing agent also contains a C1-C4 HFC or HCFC with a molecular weight of 50 to 170 g/mole and a boiling point of -60° to +50°C.
- 9. (Original) The method of Claim 1 in which the blowing agent also contains HFC-134a, HFC-236ea, HFC-365mfc, HCFC-22 or HFC-245fa.
- 10. (Original) The method of Claim 1 in which the blowing agent also comprises water at up to 4 pphp.
- 11. (Original) In a method for making a rigid polyurethane foam by reacting a polyisocyanate and a polyol in the presence of a urethane catalyst, a blowing agent, optionally water, and a silicone surfactant, the improvement which comprises employing a blowing agent comprising a C4 or C5 hydrocarbon, or mixtures thereof, with an average molecular weight of \leq 72 g/mole and a boiling point in the range of 27.8 to 50 °C, and 0.5 to 3.5 pphp silicone surfactant comprising a polyether-polysiloxane copolymer represented by the following formula:

$$(CH_3)_3$$
-Si-O- $(Si(CH_3)_2$ -O)_X- $(Si(CH_3)(R)O)_V$ -Si(CH₃)₃

where

$$R = (CH_2)_3 - O - (-CH_2 - CH_2 - O)_a - (CH_2 - CH(CH_3) - O)_b - R''$$
, and

where R" is H or CH3; x + y + 2 is 110-130; x/y is 5-8; the total surfactant molecular weight, based on the formula, is 15,000-28,000 g/mole, the wt% siloxane in the surfactant is 34-53 wt%, the blend average molecular weight (BAMW) of the polyether portion is 550-850 g/mole, and the mole% of ethylene oxide in the polyether portion is 70-100 mole%.

- 12. (Original) The method of Claim 11 in which the blowing agent comprises cyclopentane, isopentane, isobutane or mixtures thereof.
- 13. (Original) The method of Claim 11 in which the blowing agent comprises a mixture ranging from <100 to 50 wt% cyclopentane and >0 to 50 wt% isopentane, based on C5 components, and optionally also containing butane isomers.
- 14 (Original) The method of Claim 11 in which the blowing agent also contains a C1-C4 HFC or HCFC with a molecular weight of 50 to 170 g/mole and a boiling point of -60° to +50°C.
- 15. (Original) The method of Claim 11 in which the blowing agent also contains HFC-134a, HFC-236ea, HFC-365mfc, HCFC-22 or HFC-245fa.
- 16. (Original) The method of Claim 11 in which the blowing agent also comprises water at up to 4 pphp.
- 17. (Currently Amended) A rigid polyurethane foam composition comprising the following components in parts by weight (pbw):

Rigid Foam Formulation	_pbw_
Polyol	100
Silicone Surfactant	1-3
Blowing Agent	10-20
Water	0-3
Catalyst	0.5-3
Isocyanate Index	80-400

where the blowing agent comprises a C4 or C5 hydrocarbon, or mixtures thereof, with an average molecular weight of ≤ 72 g/mole and a boiling point in the range of 27.8 to 50 °C (82

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to 121°F), and the silicone surfactant comprises a polyether-polysiloxane copolymer represented by the following formula:

$$(CH_3)_3$$
-Si-O- $(Si(CH_3)_2$ -O)_X- $(Si(CH_3)(R)O)_V$ -Si(CH₃)₃

where

where R" is H, $(CH_2)_z CH_3$, or $C(O)CH_3$; x + y + 2 is $60 \ 67 \ -130$; x/y is 5 - 14; z is 0 - 4; the total surfactant molecular weight, based on the formula, is 7000 - 30,000 g/mole, the wt% siloxane in the surfactant is 32 - 70 wt%, the blend average molecular weight (BAMW) of the polyether portion is 450 - 1000 g/mole, and the mole% of ethylene oxide in the polyether portion is 70 - 100 mole%.

- 18. (Original) The composition of Claim 17 in which the blowing agent comprises cyclopentane, isopentane, isobutane or mixtures thereof.
- 19. (Original) The composition of Claim 17 in which the blowing agent comprises a mixture ranging from <100 to 50 wt% cyclopentane and >0 to 50 wt% isopentane, based on C5 components, and optionally also containing butane isomers.
- 20. (Original) The composition of Claim 17 in which the blowing agent also contains a C1-C4 HFC or HCFC with a molecular weight of 50 to 170 g/mole and a boiling point of -60° to +50°C.
- 21. (Original) The composition of Claim 17 in which the blowing agent also contains HFC-134a, HFC-236ea, HFC-365mfc, HCFC-22 or HFC-245fa.
- 22. (Original) The composition of Claim 17 in which the blowing agent comprises a mixture ranging from <100 to 50 wt% cyclopentane and >0 to 50 wt% isopentane, based on C5 components, and optionally also containing butane isomers, and the silicone surfactant is a polyether-polysiloxane copolymer represented by the following formula:

$$(CH_3)_3$$
-Si-O- $(Si(CH_3)_2$ -O)_X- $(Si(CH_3)(R)O)_y$ -Si(CH₃)₃

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where

$$R = (CH_2)_3 - O - (-CH_2 - CH_2 - O)_a - (CH_2 - CH(CH_3) - O)_b - R''$$
, and

where R" is H or CH3; x + y + 2 is 110-130; x/y is 5-8; the total surfactant molecular weight, based on the formula, is 15,000-28,000 g/mole, the wt% siloxane in the surfactant is 34-53 wt%, the blend average molecular weight (BAMW) of the polyether portion is 550-850 g/mole, and the mole% of ethylene oxide in the polyether portion is 70-100 mole%.